F·A·A·M facility for airborne atmospheric measurements

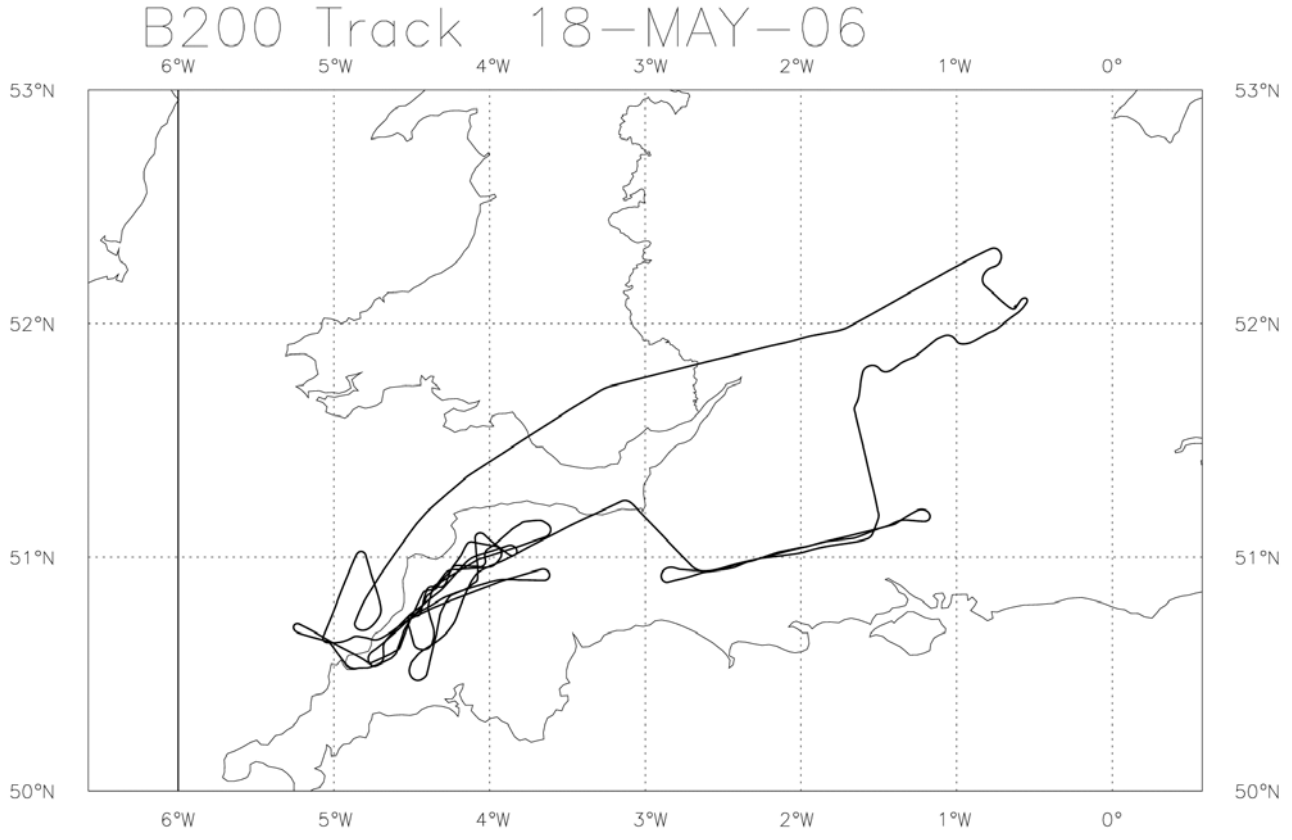
# FLIGHT FOLDER


| | |
|---|---|
| Flight No.: | B200 |
| Date: | 18 May 2006 |
| Take Off | 09:31:44 |
| Landing: | 14:20:27 |
| Flight Time | 4h48m43s |

**Campaign:** ICEPIC
**Trials Instructions:**
**Operating Area:** SW

| POB | Position | Name | Institute |
|---|---|---|---|
| 1 | Captain | Alan Roberts | Directflight |
| 2 | Co-pilot | Alan Foster | Directflight |
| 3 | CCM | Dawn Quinn | Directflight |
| 4 | Mission Scientist | Dave Kindred | Met Office |
| 5 | Flight Manager | Jim Crawford | FAAM |
| 6 | Cloud physics | Kate Turnbull | FAAM |
| 7 | Mission Scientist 2 | Alan Blyth | Leeds University |
| 8 | CPI | Hazel Jones | Manchester University |
| 9 | Mission Scientist training | Chris Taylor | CEH |
| 10 | MARSS | James Bowles | Met Office |
| 11 | CCN | Richard Cotton | Met Office |
| 12 | Core Chem / CCM2 | Jamie Trembath | FAAM |
| 13 | | | |
| 14 | | | |
| 15 | | | |
| 16 | | | |
| 17 | | | |
| 18 | | | |

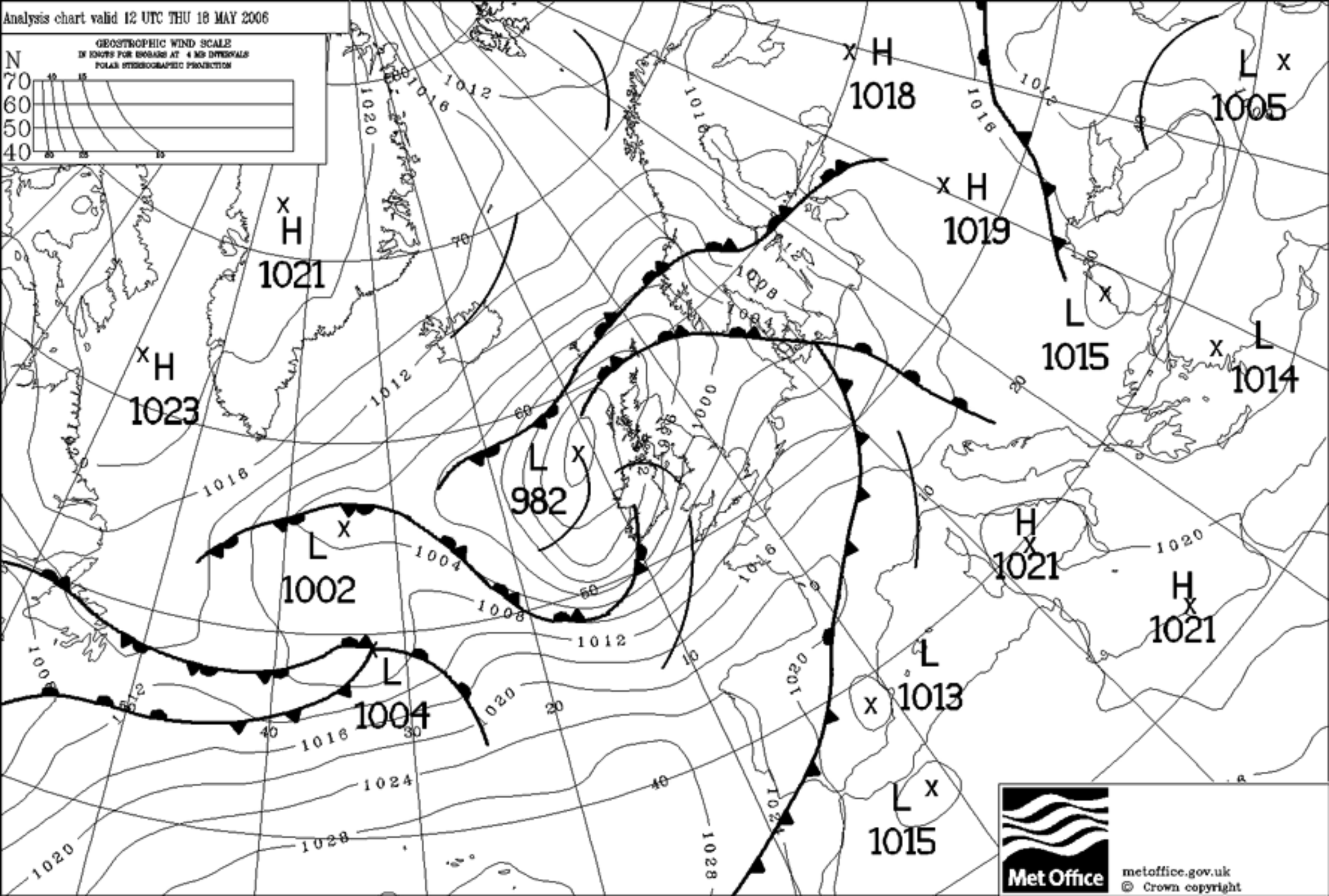
**Flight Track:**



FLIGHT SUMMARY

Flight No b200
Date: 18 May 2006
Project: ICEPIC
Location: SW

| Start Time | End Time | Event | Height (s) | Hdg | Comments |
|---|---|---|---|---|---|
| 090052 | | INU | 0.52 kft | 126 | to nav |
| 091902 | | heimann | 0.52 kft | 126 | cal 15 |
| 093144 | | T/O | 0.51 kft | 212 | Cranfield |
| 093740 | | ASP | 9.1 kft | 243 | open |
| 093828 | | twc | 9.0 kft | 241 | check ok |
| 093915 | | DI - NDI | 9.0 kft | 240 | check ok |
| 094735 | | ! | 9.1 kft | 243 | Nev & JW indicate 0 o n derived data |
| 094754 | | ! | 9.7 kft | 251 | drs data ok |
| 094811 | | ! | 10.1 kft | 254 | derived airspeed 0 |
| 094826 | | ! | 10.5 kft | 255 | port aft reset - all ok |
| 095006 | | JW | 13.7 kft | 249 | zero |
| 095028 | | NEV | 14.4 kft | 249 | zero |
| 095225 | | JW | 17.7 kft | 249 | zero |
| 095446 | | TWC | 20.0 kft | 250 | status @ -25C, fl200 |
| 100508 | | Video | 20.0 kft | 234 | #1 ffc #2 rfc |
| 101148 | 102358 | Profile 1.0 | 20.0 - 8.6 kft | 230 | |
| 102650 | 102951 | Profile 1.1 | 8.6 - 5.5 kft | 341 | |
| 102741 | | JW | 7.7 kft | 334 | zero |
| 102753 | | nev | 7.5 kft | 333 | zero |
| 103112 | 103813 | Profile 1.2 | 5.5 - 0.24 kft | 209 | |
| 104355 | 105323 | Run 1.0 | 1.6 - 1.7 kft | 053 | 500ft under cloudbase |
| 105507 | 110508 | Run 1.1 | 1.7 kft | 265 | |
| 105652 | | heimann | 1.7 kft | 269 | cal 10 |
| 111228 | 111930 | Run 2.0 | 7.0 kft | 048 | |
| 111643 | | nev | 7.0 kft | 044 | total water alarm |
| 112229 | 113441 | Run 3.0 | 8.0 kft | 272 | |
| 113725 | 114720 | Run 4.0 | 9.0 - 9.1 kft | 333 | |
| 114306 | | Video | 9.0 kft | 073 | #3 ffc #4 ffc |
| 114803 | 120548 | Run 5.0 | 10.1 - 10.0 kft | 261 | |
| 115221 | | ! | 10.1 kft | 234 | DI heater on |
| 120149 | | Video | 10.0 kft | 205 | ffc iced |
| 120654 | 121136 | Profile 2.0 | 10.0 - 5.2 kft | 291 | |
| 121021 | | ! | 6.5 kft | 291 | DI heater off |
| 121305 | 121447 | Profile 2.1 | 5.3 - 3.7 kft | 120 | qnh 1006 |
| 121511 | 121650 | Profile 2.2 | 3.6 - 1.7 kft | 153 | |
| 121749 | 123009 | Run 6.0 | 1.7 kft | 089 | qnh 1006 |
| 123241 | 124457 | Run 7.0 | 7.0 kft | 299 | |
| 124349 | | ! | 7.0 kft | 197 | DI failed |
| 124914 | 130805 | Run 8.0 | 11.0 kft | 036 | |
| 125245 | | ! | 11.0 kft | 013 | nev tw back on line |
| 125954 | | JW | 11.0 kft | 063 | zero |
| 130012 | | nev | 11.0 kft | 064 | zero |
| 130311 | | ! | 11.0 kft | 096 | ffc obscured |
| 131002 | 131932 | Run 9.0 | 11.0 kft | 091 | |
| 131259 | | Video | 11.0 kft | 078 | #5ffc #6rfc |
| 131924 | | ! | 11.0 kft | 077 | overhead Chilbolton |
| 132358 | 132710 | Profile 3.0 | 11.0 - 7.0 kft | 267 | |
| 132710 | 134237 | Run 10.0 | 7.0 kft | 245 | |
| 133010 | | ! | 7.0 kft | 255 | 14.2 m from Chilbolto |
| 134510 | 135514 | Run 11.0 | 7.0 kft | 102 | |
| 142027 | | Land | 0.55 kft | 211 | Cranfield |
| 142723 | | gps | 0.57 kft | 309 | 52'04.36N 0'37.50W |
| 143004 | | inu | 0.57 kft | 309 | 52' 01.60N 0' 38.60W |


Analysis chart valid 12 UTC THU 18 MAY 2006
GEOSTROPHIC WIND SCALE
IN KNOTS FOR 950MB AT 4 MB INTERVALS
POLAR STEREOGRAPHIC PROJECTION
N
70
60
50
40
H 1021
H 1023
L 982
L 1002
L 1004
H 1018
H 1019
L 1005
L 1015
L 1014
H 1021
H 1021
L 1013
L 1015
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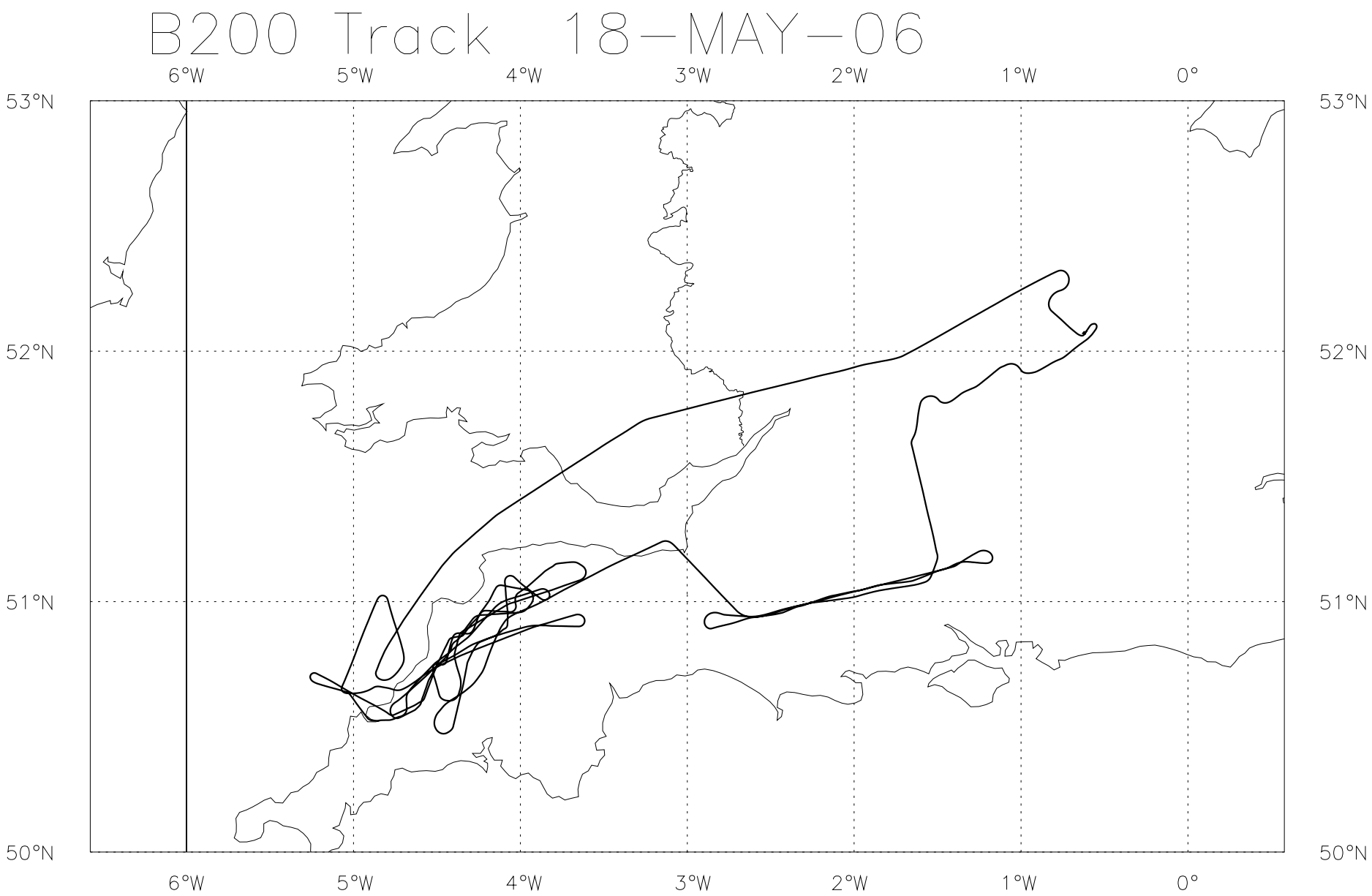
B200 Track 18-MAY-06
6°W
5°W
4°W
3°W
2°W
1°W
0°
53°N
52°N
51°N
50°N

FAAM Sortie Brief ***ICEPIC: Study of the development of cumulus clouds***

Flight No: B200 Date: 18th May 2006

Trial objectives:
To investigate the development of ice-phase and precipitation in Cu over the UK.

Location:
In developing Cu clouds over SW / Central S.England or Wales (suggest a rectangular box with NW corner at 54deg N, 06deg W and SE corner at 50deg N, 01deg W), or alternatively over E. England.

Weather:
Either individual, or groups of Cu cloud forming predominantly over land. Evolving clouds may also be tracked over the sea.

Special requirements:
Key temperature levels for cloud penetrations are 0, -3, -6, -9C then colder as reqd. If operating near Chilbolton radar, relay range/bearing of target clouds to "Radsearch" (130.575 MHz). Maintain continuous monitoring of turbulence probe differential pressures – if any icing observed, descend below freezing level to clear.

Flight pattern:

1. Take off from Cranfield at 10:00L.
2. Transit to the operating region at FL200 and identify suitable clouds (40mins).
3. Perform profile descent from FL200 to minimum permitted altitude at 1000ft/minute (70mins). May be stepped to avoid cloud penetrations. Profile ideally finishes below target clouds.
4. Perform a SLR below cloud for 10minutes in a direction determined by the mission scientist to remain in inflow of target clouds (85mins).
5. Turn onto reciprocal heading and perform a SLR at 500ft below cloudbase for ten minutes (100mins).
6. Ascend to around the 0C level or 500ft below the cloud top (110mins).
7. Perform a penetration with wings level through the cloud (115mins).
8. If a single cloud is large and clearly identifiable and the cloud is continuing to develop, make a reciprocal turn while ascending by ~1000ft (-3C in temperature) and repeat the cloud penetration several times (150mins).
9. If the cloud is not large or discrete, then proceed successively to the next visible cumulus cell, and repeat the penetrations at approximately 0C for a 10minute interval. Perform reciprocal turn while climbing by intervals of -3C and repeat 10minute runs (150mins).
10. Continue 8 and/or 9 as time permits (250mins).
11. Finish with a profile ascent from minimum permitted altitude to FL200 or 1000ft above highest cumulus tops (whichever is higher) at 1000ft/min.
12. Transit to Cranfield and land (300mins).

Note) – target clouds should be continuing to develop – look for rising cloud tops and solid, sharp-edged cloud boundaries. If red echoes show on the aircraft radar, or cloud top is decreasing, or cloud becomes heavily glaciated (diffuse boundaries) then move on to next cloud

AIRCRAFT SCIENTIST DE-BRIEFING SHEET

DATE: 18/5/06

ICEPIC (SW APPS).

FLIGHT NO: B200

INCLUDE:

1. An assessment of the flight.
2. Summary of the weather conditions.

Overall, an excellent flight. Cumulus cloud conditions (base & tops, location) were much as forecast, being present over the areas flown (N. Cornwall & Devon; and along 250° - 070° radial from/to Chilbolton radar). Winds were generally WSW'ly at levels surface to FL200, 25kts increasing to ~60kts at FL200. A line of 'growing' Cu was 'worked' along N. Cornwall / N. Devon, generally along WSW → ENE'ly ground track, where small Cu initially, became moderate then well developed (but with little glaciation) progressively in the E/ward direction. A full vertical 'stack' along this axis at differing heights, followed by a second stack with fewer levels was flown (see below). Thereafter, 2 runs ENE towards Chilbolton radar & 1 run away from the radar were flown for comparison with ground site data.

The cumulus activity gradually lessened during the sortie (as seen in vertical extent) and progressively from the West as somewhat more stable air invaded ahead of the next frontal system. An increase in Ci/Cs at high level above the aircraft, again from the West, was apparent in time.

After T/o from Cranfield at 0931 and a transit at medium level to the Bristol Channel, a profile descent FL200 ↓ 50' (ending just N. of Cornish coast, ~50°36'N, 5°00'W) was made. Thereafter, the following runs were made:

- ⊙ Runs 1.0/1.1 1500' (~500' below C. Base). heading ENE, then reciprocal WSW.
- ⊙ Run 2. FL070, Freezing level, heading NE', then ENE.
- ⊙ Run 3 FL080, Temp ~-3 → -4°C, heading WSW.

⊙ Run 4, FL090, Temp −6°C, ENE'wards

⊙ Run 5, FL100, Temp −7°C, WSW'wards.

⊙ PROFILE P2, FL100 ↓ 1500' @ ~1000'/min, over S. Bristol channel, finishing over land (N. Devon/Cornwall).

⊛ Run 6, 1500' (below C. base), ENE'wards

⊛ Run 7, FL070 (≈ freezing level) WSW'wards.

⊛ Run 8, FL110, ENE'wards. Reposition to start.

⊛ Run 9, FL110, inbound 070° Radial → CHILBOLTON

⊛ PROFILE (MINI-) P3, FL110 ↓ FL070 (~1200'/min) (finishing just to E of radar).

⊛ Run 10, FL070, outbound 250°. (Freezing Level)

⊛ Run 11, FL070, inbound 070° ( " ).

Run 11 ended W. of CHB, then the aircraft returned to Cranfield, landing at ~ 1420 L.

The De-iced Temperature sensor went to full-scale after about 3 hours into flight & remained U/S thereafter; this affected the HORACE computation/display of wind data (several comparisons were made with Flight Deck derived wind data). The Non-De-Iced Temperature worked well throughout. No significant ice-build up on external A/C & sensors was noted. Other instrumental data seemed fine.

A 'classic' ICEPIC study which should yield an extremely useful and valuable Cu cloud/convection dataset.

DLK 18/5/06.

# Mission Scientist's Log

[ICEPIC] AREA A (+CHILBOLTON)

Flight No **B**.200..... Date 18/5/06..... Page 1 of 9



| GMT | Run / Profile | Height | Hdg | GPS Position | Remarks (clouds, weather, visibility, winds, sea state etc.) |
|---|---|---|---|---|---|
| 0923 | | | | | START TAXI Cranfield. [ONBD 1006] |
| 0931 | | | | | T/O Cranfield. 6/8 Cu, clear above. |
| 0934 | | [redacted] | 310° | | Into cloud ~2600'. |
| | | | | | Slt turbulence in Cu. |
| 0936 | | FL070 | | Sig water content 6-8000' (water on windscreen) | Cloud tops above here, still in cloud. |
| | | FL084 | | | General tops here, ocnl higher Cu tops. |
| 0938 | TRANSIT | FL090 | 240° | — | Now level at FL090 |
| | | | | | |
| 094710 | " | | 260° | | In cloud at FL090, |
| | | | | | ice columns seen on CPI. |
| 094800 | | In cloud | | | Some water in this now, some ice. |
| 094810 | | Out of Cu cloud. | | | FL ~10000'. |
| 095430 | | ← → | | | Now at FL 200. Above general |
| | | | | | Cu tops at this level |
| | NOTE: FIRST PART OF | | | | PROFILE ASCENT FROM CRANFIELD |
| | UP TO 720 mb (+5°C) | | | | IN ERROR (TOO HIGH). (A) = TEMP TRACE (T) |
| | ✓ Problem with Airspeed | | | | wake; OK above this level LOVE now (720 mb) |
| | | | | | |
| 101148 | P1.0 | FL200 | 230° | 51°12'41.0" N 1°12'0" W | Start P1. WIND 240°/30 m/sec (230°(T)/30 m/sec Capt) |
| (Captain pass) | | | | | |
| Looking at Cu line building. | | | | | Cu lines now developed over Devon/Cornwall to S (increasing tops as head ENE along Cu "train"). |
| | | | | | Much less cloud (smaller Cu/Sc) over B. Channel & to West |
| | | | | | Generally ~3/8 Cu (various stages of development) |
| | | | | | 1/8 Ci ahead (low). TR of thin Ac/Sc layers over water. |

Camera ↑

[1000'/min descent]

# Mission Scientist's Log

Flight No B.200 Date 18/5/06 Page 2 of 9.



| GMT | Run / Profile | Height | Hdg | GPS Position | Remarks (clouds, weather, visibility, winds, sea state etc.) |
|---|---|---|---|---|---|
| 101910 | P1.0 | 13400 | SW. | 50° 54'N 4° 36'W | Passing 13,400'. (Profiling along N. Cornwall coast, keeping clear of cloud). |
| | | (Good | Cu echoes from | Lands End — main Cu activity over land (Cornwall/N. Devon) | |
| 102358 | Interrupt P1.0 | 8000' | | 50° 42'N 4° 48 W | Turning ↰ to avoid profiling thro cloud. onto reciprocal. |
| 102650 | Restart P1.1 | 8000' | 335° | 50° 48'N 4° 36'W | Recommence P1.0 (heading NW). |
| 102951 | Interrupt P1.1 | 5000' | 334° | 51° 00N 4° 42'W | Interrupt P1, turn ↰ Wind 220°/15m/sec (In turn) |
| 103112 | Restart P1.2 | 5000' | 207° | | Restart P1.0 |
| 1034 | | 2350' | | | Wind 223/20 m/sec (nl. Cornwall coast) |
| 10355 | | 1200' | | | Layer Sc now above & to SW. |
| | | | | | Hazy/Misty at low level. |
| 10381 | End P. 1.2 | 80' | 203° | 50° 36'N 5° 00W | End P1.2 at 50' Climb. Sea |
| | | | | | |
| 10 42 | | | | | Cloud Base over land ~2000', - 2400'. |
| | | | | | Setting up next run |
| 104355 | Run 1.0 | 1500'. | 061° | 50° 42'N 4° 30 W. | Start R1. (500' under C. Base). |
| | | | | | Towards Barnstable |
| 104530 | | | | | Rain on windscreen. |
| | | | | | Will repeat 500' under cloud (reciprocal for CCN). |
| 105323 | End R1.0 | 1510° | 076 | 50° 54'N 3° 36'W | End R1.0 Turning ↘ |
| 105507 | START R1.1 | 1510 | 265° | 50 54 3 42 | Start R1.1 WIND 220°/11m/sec. |
| 105840 | | | | | Ppn on screen. More ppn ahead at this level. |
| | | | | | Cloud tops on this run (CPI C. Physics) |
| 110430 | | | | | Wind 225°/2m/sec. |
| 110510 | End R1.1 | 1500' | 240° | 50° 42'N 4° 30'W | End R1.1 Climb to FL070. |
| 110607 | | | | | Into cloud on climb. |

# Mission Scientist's Log

Flight No **B**.200..... Date ..18/5/06..... Page 3 of 9



| GMT | Run / Profile | Height | Hdg | GPS Position | Remarks (clouds, weather, visibility, winds, sea state etc.) |
|---|---|---|---|---|---|
| 1110 | → | Cu tops | up to ~7000 ft & up to 10000' locally higher | | Manoevring before starting Run at FL070 (~freezing level) |
| | | | | | along same orientation SW → NE |
| 111228 | Run 2.0 | FL070 | 046° | 56 36 N 4 36 W | Start Run 2. |
| | | | | | 1st cell coming up 30 sec, then 2nd cell |
| | | | | | Wind 235°/23m/s, then 3rd cell (from radar). |
| 111443 | | | | | Out 1st cell. Temp −1.3°C. |
| 111535 | | | | | Lots of rain on windscreen (2nd cell) |
| | | | | | |
| 111625 | | | | | Turning 30° R for next cell. |
| | | | | | Still in 2nd cell. |
| 111700 | | | | | Clear cloud (end 2nd cell) |
| 111725 | | | → | | Into 3rd cell Temp −1.8° 238°/22m/sec. |
| 111815 | | | | | Turning into next cell. |
| | | Next cloud | tops ~10000' & building. | | End |
| | | | | | |
| 111930 | R2. | FL070 | 093° | 56°54' N 4°0W | End R2. Manoeuvre & climb 1000' for −3–4° level. |
| | | | | | Green cloud tops ~ |
| 112229 | R3 | FL080 | 273° | 56°0 N 4° W | Start R3 [ |
| | | | | Ice | Columns two (CPI). |
| 112345 | | | | | Mod rain on windscreen [Temp −4°C] |
| 112415 | | | | | Clear of cloud now [Wind 238°/22m/sec] |
| 112600 | | | | | Enter cloud now. |
| 112613 | | | | | Mod rain on windscreen. |
| 112653 | | | | | Out of cloud. |

Active cell ahead now

# Mission Scientist's Log

Flight No B290 Date 18/5/06 Page 4 of 9



| GMT | Run / Profile | Height | Hdg | GPS Position | Remarks (clouds, weather, visibility, winds, sea state etc.) |
|---|---|---|---|---|---|
| 112745 | | | | | Into next cell (big one! partial red centre) |
| 112800 | | | | → | Mod/Heavy rain |
| 112843 | | | | | Again Mod/Heavy rain |
| 112910 | | | | | Out of cloud, heading ↓ for next cell. Temp [-5.5°] |
| 113015 | | | | | Entering next (smaller) cell |
| | | | | | (tops lower of this one) |
| | | | | | smaller ew (in area) ahead as progress SW'wards. |
| | | | | | |
| 113125 | | | | | Rain here. |
| 113208 | | | | | In cloud tops. |
| 113430 | | | → | | CPI - Icing now. |
| 113440 | R3 END | FL080 | | 50 30'N 4° 24'W | End Run 3 at FL080 [Temp -3.5C] |
| | | | | | (SW end) |
| | | | | | Climb 1000' (~3°C) for next run. |
| 113725 | START R4. | FL090 | 336° | 50 42 4° 15'W | Start R.4. at FL090 [Temp -6.3] |
| | | | | | [Wind 225°/24 m/sec]. |
| 113920 | | | | | Entering cell - (tops ~ 12000') |
| 114012 | | | → | | Entering cell |
| 114050 | | | | | Out cloud. |
| 114125 | | | | | Enter next cell. Some ice here (CPI & C. Physics) |
| 114245 | | | | | Clear now. |
| 114459 | | | | | Enter next cell. |
| 114526 | | | | | Heavy rain here. |

# Mission Scientist's Log

Flight No B.200..... Date 18/5/06..... Page 5 of 9.

FAAM © 2004

| GMT | Run / Profile | Height | Hdg | GPS Position | Remarks (clouds, weather, visibility, winds, sea state etc.) |
|---|---|---|---|---|---|
| 1147 | | | | | Clear cloud, Ci invading from W |
| 114720 | 4.0 | | | | End R4 |
| 114803 | 5.0 | FL100 | 360° | 51°6'N 3°42'W | Start Run 5 Temp [Pass low with TAT] Wind [Manoeuvred CR to CPI probe in last cell] |
| 1150 | → | | | | Temp −7.2°C Wind 235°/15m/sec |
| 115249 | | | | | Out cell. In out of string of cells ahead. |
| | | | | | (General cloud tops ~FL100 Ocnl tops higher) |
| | | | | | Thickening Ci overhead as heading SW'wards. |
| 120420 | | | ← | | In cloud |
| 120548 | END R5.0 | FL100 | | 50°30'N 4°48'W | End Run 5. (1006mb) |
| 120654 | P2.0 start | FL100 | | 50°30'N 4°48'W | Start Profile P2.0 ↘ 1000'/min |
| 121135 | Levelled P2.0 | 5000' | 295° | 50°42'N 5°12'W | Interrupt P2 at 5000' (1006 mb) |
| 121305 | START 2.1. | 5000' | 714° | | Restart P2.1. ↘ 1500' @ 1000'/min |
| 121440 | END P2.1 | 3400' | | | Interrupt P2.1 (ATC) |
| 121511 | START 2.2 | 3400' | 155° | 50°36'N 4°54W | Recommence P2.2 |
| | | | | | Ahead [illegible] WSW |
| | | | | | (along N. Devon coast) |
| 121650 | END P2.2 | 1500' | | | End P2.2 Manoeuvre before start run under cloud (~500' below C. Base). |
| 12175 | START P6.0 | 1500' | 095° | 50°30'N 4°48'W | Start R6.0 below cloud. |
| 121910 | | | → | | Head to N. coast & continue run under cloud (or closer to coast) ✓ |
| | | | | | |

12'2100

Rain on screen; trying to stay ~500' under C. Base

# Mission Scientist's Log

[-9°C]

Flight No **B**200 Date 15/5/06 Page 6 of 9.



| GMT | Run / Profile | Height | Hdg | GPS Position | Remarks (clouds, weather, visibility, winds, sea state etc.) |
|---|---|---|---|---|---|
| 122240 | | | | | Now on N. side of heavier rain (will lower c. base) |
| 1223 | R6.0 | 1500' | 053° | 50° 42' N 4° 24' W | Temp +9°C ; Wind 220°/18 m/sec |
| 122505 | | | | | Rain on windscreen. Heavy rain + sfc (SE) (Bodmin Moor) |
| 123009 | R6.0 | 1500' | | 51° 0 N 3° 48 W | Hand R6. Climb to FL070 (N Freezing Level) |
| 123241 | START R7.0 | FL070 | 300° | 51° 0N 3° 54W | Start R7 at FL070. (Thicker Ci, Cs above) |
| 123328 | | | | | Into cloud (mainly in c. tops). |
| | | | | | Changing heading to pass thro' more Cu cells on this run (several times). |
| 123545 | | | | | Several Cu tops ~ FL070 around here |
| | | | | | Occ tops to FL100+ (Heavier echos ahead) |
| 1238 | | | → | | Entering next cell complex. |
| 124000 | | | | | Mod/[redacted] rain on windscreen. |
| 124032 | | | | | " " (again). |
| 1241. | | | | | (TAT to offscale ; Turn on heater again) |
| 124457 | END R7.0 | FL070 | 198° | 50° 30' N 4° 18' W | Hand R7 at FL070. Climb to FL110 |
| | | | | | (TRACK OF R7). |
| 1246 | | | | | 6/8 Ci Cs above now. |
| | | | | | Setting up for next run SW → NE heading |
| 124914 | START R8.0 | FL110 | 051° | 50° 30' N 4° 24' W | Start R8.0 \| TAT Temp still u/s from DLI probe \| NAI OK though. probe. |
| 125120 | | | → | | Into cloud, Many columns here (CPI) |
| 125225 | | | → | | Out of cloud WIND 230/25 m/sec |

# Mission Scientist's Log

Flight No **B**200 Date 18/5/06 Page 7 of 9



| GMT | Run / Profile | Height | Hdg | GPS Position | Remarks (clouds, weather, visibility, winds, sea state etc.) |
|---|---|---|---|---|---|
| 125315 | | | | | Into next cell. |
| 125355 | | | | | Mod rain now (on windscreen) |
| 125416 | | | | | Out of cloud now. — line of larger Cu to ~~SSE~~ (to ESE) |
| 125600 | | | | | Into cloud & out (~10 secs) |
| | | | | | Extending Run 8.0 from N. Deveron to become 1st of approaches to Chilbolton |
| | | | | (Radial 070°) | at this level (FL110). |
| 125815 | | | | | Still in cloud. |
| 125900 | | | | | Out of cloud for few minutes (J/W to be zeroed) |
| 130100 | | Cloud report | | 51°6 N 3°6 W | Cu generally up to FL100, occ tops higher 4/8 Ci/Cs above |
| | | | | | |
| 130320 | R8.0 | FL110 | 136° | 51°06'N 3°06'W | Message to Chilbolton to be o/h at 1323 |
| | | | | 4/8 Cu | Clouds less 'energetic' here (lg. tops 7–8000' occ tops 10000') |
| 130809 | End R8. | FL110 | 148° | 50°54'N 02°42'W | End R8.0. [Wind 230°/25 m/sec] |
| | | | | | |
| 13100 | START R9 | FL110 | 085° | 50°54'N 2°30'W | Start R9.0 45 mls to CHB. |
| 1314 | | → | | | Above Cu field at this height generally occ Cu to ~FL130 (above & to NE) |
| | | | | | |
| 131844 | | | | | 9 mls → 7½ mls (larger Cu) tops up to 12000' taken picture here (2) |
| 131924 | R9 | F | | | O/h Chilbolton now! |
| 131932 | End R9. | FL110 | (080°) | 51°06'N 01°18'W | End R9. (just past O/h CHB), turn |
| 13 | | | | clouds | Clear above; 6/8 Cu below gen tops 7000', |
| | | | | | Descend to FL070 for next Run (Approx FL) |
| | | | | | AFTER passing CHB AT FL110. |

# Mission Scientist's Log

Flight No **B** 200 Date 18/5/06 Page 8 of 9



| GMT | Run / Profile | Height | Hdg | GPS Position | Remarks (clouds, weather, visibility, winds, sea state etc.) |
|---|---|---|---|---|---|
| 132358 | P3.0 | FL110 | 248° | 51°6'N 1°18W. | Start Profile P3.0 (~1200'/min) |
| 132522 | | | | → | Into cloud now |
| 132605 | → | FL083 | | → [ | Columns on CPI here ] |
| 132640 | | | | | Rain on Windscreen |
| 132710 | End P3.0 Start R10 | FL070 | 245° | 51°0'N 1°36'W | End P3.0 / Start R10. [ HORACE Incorrect WIND DITEMP U/S ] |
| 132757 | | | | | Out cloud now [ Winds 230/12kt Flight Deck Wind. ] |
| | | | | | [ WIND 230/37kt ] |
| | | | ← | | Camera flix ③, ④, ⑤. [ Stbd, forward & port. ] |
| 133030 | | | | | Out of cloud now. |
| 133125 | | | → | { | Cu tops now lower ahead on this run |
| 133210 | | | | { | Ci/Cs thicker to W on this run. & layer cloud to W thickening. |
| 1335. | | | | { | Camera shot ⑥ of Cloud ahead ⑦ |
| | | | | { | |
| 133624 | | | | Cu | Cells ahead just passing Photo ⑧ |
| 133647 | Good | | Droplets CPI [ C. Physics ] | | Pass thro cell } 39 NM from CHB. |
| 133702 | ISOLATED Cu. | | | | Out of cell. } [ NDI. Temp −0.2°C ] |
| 134237 | End R10 | FL070 | | 50°48'N 2°18'W | End R10. More Ci/Cs above |
| | | | | (SOME CU STABILISATION) | Sc/Ac at this end, also some layer cloud here (generally more "messy") |
| 134510 | Start R11 | FL070 | 101° | 50°54N 2°36W | Start R11 at FL070. |
| 1347 | | | → | | Thin cloud tops now. |
| 1352. | | | | | Photos ⑨, ⑩ on this E'bound leg. |
| 1353 | | | | | C. Tops up to FL090 ahead (stabilising here). |
| | | | | | |
| 135514 | End R11 | FL070 | 090 | 51°0'N 01°30'W | End R11. (16 W. CHB). Descend & RTB |
| 135620 | | | | | Into cloud. |

4 pts p.

# Mission Scientist's Log

Flight No B...200...: Date ...18/5/06... Page 9 of 9

FAAM © 2004

| GMT | Run / Profile | Height | Hdg | GPS Position | Remarks (clouds, weather, visibility, winds, sea state etc.) |
|---|---|---|---|---|---|
| 1412 | | | → | | Complex routing back from CHB W of |
| | | | | | to Cranfield. (In much cloud) |
| N 1420. | | | → | | LAND CRANFIELD |
| 0931 T/O. | | | | | |
| 4:50m | | | | | |
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# CLOUD PHYSICS LOG Flight B

| Date:18/05/06 | Operator: KT | DRS Time: 08:30:00 | DAU1 Time: +0 | DAU2 Time: +0 | DAU3 Time: +0 | Aux1 Time: +0 | Aux2 Time: +0 | Page 1 of 1 |
|---|---|---|---|---|---|---|---|---|

| G.M.T | PCASP | | FFSSP | SID1 | SID2 | 2D2-C | | 2D2-P | | CIP25 | | | CIP100 | | | Habit | Remarks |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Conc/cc | Mean R | Block TX | Count | Count | Conc/L | Max size | Conc/m3 | Max size | Conc m3 | Max size | LWC | Conc m3 | Max size | LWC | | |
| 10:11:50 | 121 | 0.07 | 270 | 0 | | | | | | | | | | | | | FL200 start P1 |
| 10:12:55 | 147 | 0.06 | 270 | 0 | | | | | | | | | | | | | FL190 |
| 10:13:57 | 197 | 0.06 | 270 | 0 | | | | | | | | | | | | | FL180 |
| 10:15:32 | 195 | 0.06 | 270 | 1 | | | | | | | | | | | | | FL170 |
| 10:16:20 | 124 | 0.06 | 270 | 0 | | | | | | | | | | | | | FL160 |
| 10:17:42 | 274 | 0.06 | 270 | 1 | | | | | | | | | | | | | FL150 |
| 10:19:09 | 246 | 0.07 | 270 | 1 | | | | | | | | | | | | | FL140 |
| 10:20:20 | 273 | 0.06 | 270 | 3 | | | | | | | | | | | | | FL130 |
| 10:21:18 | 333 | 0.06 | 270 | 3 | | | | | | | | | | | | | FL120 |
| 10:22:07 | 203 | 0.06 | 270 | 0 | | | | | | | | | | | | | FL110 |
| 10:22:48 | 350 | 0.06 | 270 | 1 | | | | | | | | | | | | | FL100 |
| 10:23:30 | 325 | 0.06 | 270 | 3 | | | | | | | | | | | | | FL090 |
| 10:23:59 | 389 | 0.06 | 270 | 3 | | | | | | | | | | | | | FL086 interrupt P1.0 |
| 10:26:00 | 232 | 0.07 | 270 | 3 | | | | | | | | | | | | | |
| 10:26:50 | 246 | 0.07 | 270 | 3 | | | | | | | | | | | | | FL086 continue P1.1 |
| 10:27:20 | 279 | 0.07 | 270 | 8 | | | | | | | | | | | | | FL080 |
| 10:28:16 | 242 | 0.07 | 270 | 9 | | | | | | | | | | | | | FL070 |
| 10:29:15 | 222 | 0.06 | 270 | 20 | | | | | | | | | | | | | FL060 |
| 10:29:57 | 249 | 0.07 | 270 | 10 | | | | | | | | | | | | | FL055 interrupt P1.1 |
| 10:31:12 | 186 | 0.07 | 270 | 10 | | | | | | | | | | | | | FL055 continue P1.2 |
| 10:31:49 | 201 | 0.07 | 270 | 10 | | | | | | | | | | | | | FL050 |
| 10:33:03 | 226 | 0.07 | 270 | 10 | | | | | | | | | | | | | FL040 |
| 10:34:13 | 419 | 0.07 | 270 | 90 | | | | | | | | | | | | | FL030 |
| 10:35:10 | 354 | 0.07 | 270 | 90 | | | | | | | | | | | | | FL020 |
| 10:36:24 | 416 | 0.07 | 270 | 100 | | | | | | | | | | | | | FL010 |
| 10:37:09 | 445 | 0.07 | 270 | 100 | | | | | | | | | | | | | FL005 |
| 10:38:12 | 439 | 0.08 | 270 | 100 | | | | | | | | | | | | | End P1.2 at 50FT |
| 10:39:38 | 357 | 0.08 | 270 | 100 | | | | | | | | | | | | | FL010 |
| 10:41:30 | 369 | 0.08 | 270 | 90 | | | | | | | | | | | | | FL020 |
| 10:43:00 | 418 | 0.07 | 271 | 100 | | | | | | | | | | | | | |
| 10:43:53 | 380 | 0.07 | 271 | 80 | | | | | | | | | | | | | Start R1 (500FT below cloud) |
| 10:46:00 | 329 | 0.08 | 271 | 40 | | | | | | | | | | | | | |
| 10:47:00 | 307 | 0.08 | 271 | 40 | | | | | | | | | | | | 1 | |
| 10:49:00 | 395 | 0.08 | 271 | 80 | | 1.00 | 800 | 0.07 | 800 | | | | | | | 1 | |
| 10:51:00 | 443 | 0.08 | 271 | 80 | | 0 | 800 | 0.007 | 800 | | | | | | | 1 | |
| 10:53:00 | 358 | 0.08 | 271 | 50 | | | | | | | | | | | | | |
| 10:53:23 | 315 | 0.08 | 271 | 50 | | | | | | | | | | | | | End R1.0 |
| 10:55:10 | 340 | 0.08 | 271 | 50 | | | | | | | | | | | | | Start R1.1 |
| 10:57:00 | 332 | 0.08 | 271 | 70 | | | | | | | | | | | | | |
| 10:58:10 | 740 | 0.08 | 271 | 90 | | 1.5 | 0 | 233 | 1000 | | | | | | | 1 | |
| 10:59:00 | 446 | 0.08 | 273 | 90 | | 0.5 | 0 | 108 | 1000 | | | | | | | 1 | |
| 11:00:06 | 377 | 0.08 | 273 | 80 | | | | 116 | 1000 | | | | | | | 1 | |
| 11:02:00 | 287 | 0.08 | 273 | 60 | | 0 | 0 | 0 | 0 | | | | | | | | |
| 11:03:16 | 351 | 0.07 | 273 | 40 | | 0.5 | 800 | 0.007 | 1000 | | | | | | | 1 | |
| 11:05:09 | 318 | 0.07 | 273 | 30 | | | | | | | | | | | | | End R1.1 |
| 11:06:09 | 2633 | 0.06 | 295 | 1000 | | 3 | 400 | 283 | 1000 | | | | | | | 1 | Into cloud |

# CLOUD PHYSICS LOG Flight B

| Date:18/05/06 | Operator: KT | DRS Time: 08:30:00 | DAU1 Time: +0 | DAU2 Time: +0 | DAU3 Time: +0 | Aux1 Time: +0 | Aux2 Time: +0 | Page 2 of 2 |
|---|---|---|---|---|---|---|---|---|

| G.M.T | PCASP | | FFSSP | SID1 | SID2 | 2D2-C | | 2D2-P | | CIP25 | | | CIP100 | | | Habit | Remarks |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Conc/cc | Mean R | Block TX | Count | Count | Conc/L | Max size | Conc/m3 | Max size | Conc m3 | Max size | LWC | Conc m3 | Max size | LWC | | |
| 11:08:00 | 116 | 0.08 | 311 | 8 | | 0 | 0 | 0 | 0 | | | | | | | | FL070 |
| 11:10:00 | 154 | 0.07 | 312 | 2000 | | 14 | 0 | 0.007 | 1000 | | | | | | | | |
| 11:12:00 | 9584 | 0.06 | 386 | 4000 | | 12 | 400 | 8.337 | 1000 | | | | | | | 1 | |
| 11:12:28 | 14584 | 0.07 | 455 | 5000 | | 132 | 325 | 291 | 1000 | | | | | | | 1 | Start R2 at FL070 |
| 11:14:25 | 2035 | 0.06 | 602 | 4000 | | | 400 | | 1000 | | | | | | | 1 | 1st cell |
| 11:15:20 | 219 | 0.07 | 607 | 4000 | | 120 | 625 | 2125 | 1500 | | | | | | | 1 | 2nd cell |
| 11:16:20 | 4416 | 0.06 | 727 | 1000 | | 17 | 300 | | 500 | | | | | | | 1 | |
| 11:17:40 | 1326 | 0.06 | 807 | 4000 | | 51.5 | 550 | 366 | 500 | | | | | | | 1 | 3rd cell ISOL graupel? |
| 11:19:00 | 14465 | 0.07 | 873 | 4000 | | 58 | 125 | 25 | 500 | | | | | | | 1 | End R2 |
| 11:21:00 | 283 | 0.07 | 921 | 8 | | 0 | 0 | 0 | 0 | | | | | | | | FL080 |
| 11:22:30 | 8915 | 0.06 | 936 | 4000 | | 132 | 600 | 16400 | 500 | | | | | | | 5 | Start R3.0 at FL080 |
| 11:24:00 | 13656 | 0.07 | 1043 | 4000 | | 6.5 | 100 | | 500 | | | | | | | 5 | |
| 11:26:00 | 5517 | 0.06 | 1062 | 4000 | | 398 | 725 | 6991 | 1500 | | | | | | | 5 | Some large drops too |
| 11:28:00 | 10915 | 0.07 | 1166 | 4000 | | 236 | 775 | 2100 | 2000 | | | | | | | 1 | Some ice |
| 11:30:00 | 294 | 0.06 | 1277 | 1000 | | 146 | 275 | 416 | 275 | | | | | | | 8 | Mix drops, ice |
| 11:32:00 | 821 | 0.06 | 1392 | 4000 | | 378 | 575 | 1950 | 1000 | | | | | | | 1 | Some ice |
| 11:34:00 | 6312 | 0.06 | 1447 | 4000 | | 687 | 650 | 10958 | 650 | | | | | | | | Ice, drops, needles |
| 11:34:30 | 11453 | 0.07 | 1493 | 4000 | | 453 | 750 | 6216 | 1500 | | | | | | | 5 | End R3.0 Drops & ice too |
| 11:37:29 | 3159 | 0.06 | 1518 | 2000 | | 0 | 0 | 0 | 0 | | | | | | | | Start R4 at FL090 |
| 11:39:00 | 9150 | 0.07 | 1569 | 5000 | | 494 | 325 | 25 | 400 | | | | | | | 7 | Graupel? |
| 11:40:20 | 14716 | 0.06 | 1621 | 6000 | | 501 | 775 | 2391 | 800 | | | | | | | 11 | Some plates/graupel needles |
| 11:41:30 | 1790 | 0.08 | 1650 | 1000 | 237 | 450 | 3533 | 16291 | 1500 | | | | | | | 5 | Some snow and ice |
| 11:45:00 | 5247 | 0.06 | 1698 | 500 | | 372 | 400 | 3308 | 2000 | | | | | | | 11 | Some snow/needles |
| 11:47:00 | 217 | 0.07 | 1776 | 5 | | 0 | 0 | 0 | 0 | | | | | | | | |
| 11:48:00 | 207 | 0.06 | 1776 | 0 | | 0 | 0 | 0 | 0 | | | | | | | | Start R5 at FL100 |
| 11:48:30 | 9612 | 0.07 | 1839 | 5000 | | 154 | 275 | 366 | 1500 | | | | | | | 11 | Some snow/needles |
| 11:49:26 | 14184 | 0.06 | 1876 | 6000 | | 327 | 550 | 116 | 2000 | | | | | | | 11 | Some snow/needles |
| 11:51:30 | 14306 | 0.06 | 1928 | 1000 | | 125 | 400 | 17416 | 2000 | | | | | | | 5 | Some 8, 7, 11 |
| 11:53:30 | 780 | 0.06 | 1971 | 800 | | 38 | 400 | 183 | | | | | | | | 7 | Mix |
| 11:54:40 | 5033 | 0.06 | 1990 | 4000 | | | | | | | | | | | | 4 | Mix Dendrites? |
| 11:56:00 | 240 | 0.07 | 2015 | 5 | | 0 | 0 | 0 | 0 | | | | | | | | |
| 11:56:30 | 5212 | 0.06 | 2031 | 4000 | | 123 | 200 | | 200 | | | | | | | | Mix |
| 11:57:50 | 13711 | 0.06 | 2052 | 5000 | | 251 | 300 | 1818 | 300 | | | | | | | 8 | Mixture some graupel/ice |
| 11:59:00 | 225 | 0.06 | 2080 | 5 | | 0 | 0 | 0 | 0 | | | | | | | | |
| 11:59:26 | 12016 | | 2114 | 4000 | | 340 | 200 | 330 | 200 | | | | | | | 8 | Mix |
| 12:02:00 | 457 | 0.06 | 2122 | 1000 | | 0 | 0 | 0 | 1000 | | | | | | | 3 | Mix |
| 12:03:00 | 1937 | 0.06 | 2131 | 2000 | | 70.5 | 750 | 26785 | 1500 | | | | | | | 5 | Mix, mainly columns |
| 12:04:00 | 1993 | 0.07 | 2134 | 4000 | | 1752 | 725 | 28950 | 725 | | | | | | | 5 | Some ice, snow |
| 12:05:47 | 262 | 0.06 | 2179 | 0 | | 0 | 0 | 0 | 0 | | | | | | | | End Run 5.0 |
| 12:06:54 | 262 | 0.06 | 2179 | 5 | | 0 | 0 | 0 | 0 | | | | | | | | Start P2 at FL100 |
| 12:07:55 | 289 | 0.06 | 2179 | 4 | | 0 | 0 | 0 | 0 | | | | | | | | FL090 |
| 12:08:55 | 288 | 0.06 | 2179 | 0 | | 0 | 0 | 0 | 0 | | | | | | | | FL080 |
| 12:09:50 | 359 | 0.06 | 2179 | 5 | | 0 | 0 | 0 | 0 | | | | | | | | FL070 |
| 12:10:43 | 540 | 0.06 | 2179 | 200 | | 0 | 0 | 0 | 0 | | | | | | | | FL060 |
| 12:11:48 | 1427 | 0.06 | 2179 | 900 | | 0 | 0 | 0 | 0 | | | | | | | | FL050 P2 interrupted |
| 12:13:12 | 709 | 0.06 | 2179 | 100 | | 0 | 0 | 0 | 0 | | | | | | | | P2 continued |
| 12:13:27 | 313 | 0.07 | 2179 | 200 | | 0 | 0 | 0 | 0 | | | | | | | | FL040 |

# CLOUD PHYSICS LOG Flight B

| Date:18/05/06 | Operator: KT | DRS Time: 08:30:00 | DAU1 Time: +0 | DAU2 Time: +0 | DAU3 Time: +0 | Aux1 Time: +0 | Aux2 Time: +0 | Page 3 of 3 |
|---|---|---|---|---|---|---|---|---|



| G.M.T | PCASP | | FFSSP | SID1 | SID2 | 2D2-C | | 2D2-P | | CIP25 | | | CIP100 | | | Habit | Remarks |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Conc/cc | Mean R | Block TX | Count | Count | Conc/L | Max size | Conc/m3 | Max size | Conc m3 | Max size | LWC | Conc m3 | Max size | LWC | | |
| 12:15:33 | 436 | 0.07 | 2179 | 80 | | 0 | 0 | 0 | 0 | | | | | | | | FL030 |
| 12:16:24 | 511 | 0.07 | 2179 | 100 | | 0 | 0 | 0 | 0 | | | | | | | | FL020 |
| 12:16:50 | 492 | 0.07 | 2179 | 80 | | 0 | 0 | 0 | 0 | | | | | | | | P2.2 end at FL017 |
| 12:17:47 | 457 | 0.07 | 2179 | 20 | | 0 | 0 | 0 | 0 | | | | | | | | Start run at FL017 |
| 12:20:00 | 464 | 0.07 | 2179 | 80 | | 0.5 | 500 | 100 | 500 | | | | | | | 1 | |
| 12:22:00 | 332 | 0.07 | 2180 | 80 | | 0 | 0 | 0 | 0 | | | | | | | | |
| 12:23:30 | 383 | 0.07 | 2181 | 90 | | 12 | 175 | 2583 | 200 | | | | | | | 1 | |
| 12:25:00 | 450 | 0.07 | 2181 | 90 | | 8.5 | 800 | 550 | 800 | | | | | | | 1 | |
| 12:27:00 | 420 | 0.07 | 2182 | 50 | | 0 | 0 | 0 | 0 | | | | | | | | |
| 12:28:00 | 372 | 0.08 | 2182 | 70 | | 1.5 | 600 | 16 | 1500 | | | | | | | 1 | |
| 12:30:09 | 376 | 0.07 | 2182 | 80 | | 0 | 0 | 0 | 0 | | | | | | | | End Run 6 |
| 12:32:00 | 183 | 0.07 | 2187 | 20 | | 0 | 0 | 0 | 0 | | | | | | | | |
| 12:32:36 | 191 | 0.08 | 2187 | 90 | | 0 | 0 | 0 | 0 | | | | | | | | Start run 7 at FL070 |
| 12:33:30 | 7404 | 0.07 | 2197 | 1000 | | | 300 | 66 | 1000 | | | | | | | 1 | Some ice/graupel |
| 12:36:00 | 305 | 0.08 | 2204 | 9 | | 3.5 | 400 | 141 | 1200 | | | | | | | 5 | Some graupel/snow and ice |
| 12:38:00 | 533 | 0.06 | 2252 | 100 | | 102 | 725 | 11800 | 2000 | | | | | | | 3 | Graupel/ice/needles too |
| 12:39:00 | 8690 | 0.06 | 2273 | 3000 | | 168 | 800 | 9750 | 1000 | | | | | | | 3 | Some needles |
| 12:40:30 | 11952 | 0.07 | 2333 | 5000 | | 602 | 660 | 1700 | 1500 | | | | | | | 3 | Some needles/ice |
| 12:42:00 | 7827 | 0.07 | 2500 | 3000 | | 518 | 550 | 2391 | 550 | | | | | | | 3 | Some graupel/ice |
| 12:43:30 | 9648 | 0.06 | 2540 | 4000 | | 1862 | 500 | 8400 | 2000 | | | | | | | 3 | Some ice |
| 12:44:57 | 308 | 0.06 | 2577 | 0 | | 0 | 0 | 0 | 0 | | | | | | | | End R7 at FL070 |
| 12:47:00 | 245 | 0.07 | 2577 | 5 | | 0 | 0 | 0 | 0 | | | | | | | | |
| 12:49:14 | 288 | 0.06 | 2577 | 5 | | 0 | 0 | 0 | 0 | | | | | | | | Start R8.0 at FL110 |
| 12:51:25 | 1184 | 0.06 | 2582 | 2000 | | 358 | 450 | 46000 | 450 | | | | | | | 5 | Some aggregates |
| 12:53:30 | 6107 | 0.06 | 2602 | 3000 | | 1236 | 700 | 73608 | 750 | | | | | | | 5 | Some aggregates |
| 12:56:00 | 292 | 0.06 | 2624 | 5 | | 0 | 0 | 0 | 0 | | | | | | | | |
| 12:56:52 | 4323 | 0.06 | 2639 | 2000 | | 1127 | 775 | 74508 | 800 | | | | | | | 5 | Some aggregates |
| 12:58:10 | 4635 | 0.06 | 2664 | 2000 | | 136 | 750 | 12991 | 800 | | | | | | | 5 | Some aggregates |
| 13:00:00 | 301 | 0.07 | 2872 | 0 | | 0 | 0 | 0 | 0 | | | | | | | | |
| 13:02:00 | 295 | 0.06 | 2672 | 5 | | 0 | 0 | 0 | 0 | | | | | | | | |
| 13:04:00 | 287 | 0.06 | 2674 | 3000 | | 549 | 625 | 28991 | 625 | | | | | | | 5 | Some aggregates |
| 13:06:00 | 314 | 0.07 | 2690 | 0 | | 0 | 0 | 0 | 0 | | | | | | | | |
| 13:08:05 | 295 | 0.07 | 2690 | 4 | | 0 | 0 | 0 | 0 | | | | | | | | End Run 8 |
| 13:10:00 | 357 | 0.07 | 2690 | 5 | | 0 | 0 | 0 | 0 | | | | | | | | Start Run 9 at FL110 |
| 13:12:00 | 331 | 0.07 | 2690 | 4 | | 0 | 0 | 0 | 0 | | | | | | | | |
| 13:14:00 | 453 | 0.08 | 2690 | 5 | | 0 | 0 | 0 | 0 | | | | | | | | |
| 13:16:00 | 370 | 0.08 | 2690 | 5 | | 0 | 0 | 0 | 0 | | | | | | | | |
| 13:18:00 | 432 | 0.08 | 2690 | 5 | | 0 | 0 | 0 | 0 | | | | | | | | |
| 13:19:24 | 347 | 0.08 | 2690 | 0 | | 0 | 0 | 0 | 0 | | | | | | | | End Run 9 overhead Chilbolton |
| 13:21:00 | 4377 | 0.08 | 2690 | 5 | | 0 | 0 | 0 | 0 | | | | | | | | |
| 13:23:00 | 446 | 0.08 | 2690 | 7 | | 0 | 0 | 0 | 0 | | | | | | | | |
| 13:23:49 | 446 | 0.08 | 2690 | 3 | | 0 | 0 | 0 | 0 | | | | | | | | Start P3.0 from FL110 |
| 13:24:39 | 377 | 0.08 | 2690 | 3 | | 0 | 0 | 0 | 0 | | | | | | | | FL100 |
| 13:25:29 | 3085 | 0.07 | 2690 | 5000 | | 348 | 750 | 9591 | 2000 | | | | | | | 5 | FL090 |
| 13:26:29 | 6955 | 0.06 | 2742 | 1000 | | 158 | 500 | 5093 | 2000 | | | | | | | | FL080 |
| 13:27:10 | 8023 | 0.07 | 2775 | 5000 | | 66 | 775 | 775 | 2000 | | | | | | | 5 | FL070 end P3.0 start Run 10 some drops |

# CLOUD PHYSICS LOG Flight B

| Date:18/05/06 | Operator: KT | DRS Time: 08:30:00 | DAU1 Time: +0 | DAU2 Time: +0 | DAU3 Time: +0 | Aux1 Time: +0 | Aux2 Time: +0 | Page 4 of 4 |
|---|---|---|---|---|---|---|---|---|



| G.M.T | PCASP | | FFSSP | SID1 | SID2 | 2D2-C | | 2D2-P | | CIP25 | | | CIP100 | | | Habit | Remarks |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Conc/cc | Mean R | Block TX | Count | Count | Conc/L | Max size | Conc/m3 | Max size | Conc m3 | Max size | LWC | Conc m3 | Max size | LWC | | |
| 13:29:00 | 331 | 0.10 | 2856 | 5 | | 0 | 0 | 0 | 0 | | | | | | | | |
| 13:29:35 | 9372 | 0.09 | 2864 | 9 | | 0 | 0 | 0 | 0 | | | | | | | | |
| 13:31:00 | 309 | 0.10 | 2864 | 3 | | 0 | 0 | 0 | 0 | | | | | | | | |
| 13:33:00 | 315 | 0.09 | 2864 | 3 | | 0 | 0 | 0 | 0 | | | | | | | | |
| 13:35:00 | 354 | 0.10 | 2864 | 10 | | 0 | 0 | 0 | 0 | | | | | | | | |
| 13:36:50 | 13460 | 0.07 | 2893 | 40000 | | | | | | | | | | | | 1 | |
| 13:38:00 | 303 | 0.10 | 2909 | 20 | | 0 | 0 | 0 | 0 | | | | | | | | |
| 13:40:00 | 354 | 0.11 | 2909 | 10 | | 0 | 0 | 0 | 0 | | | | | | | | |
| 13:42:00 | 323 | 0.12 | 2912 | 3 | | 0 | 0 | 0 | 0 | | | | | | | | |
| 13:42:35 | 267 | 0.12 | 2912 | 3 | | 0 | 0 | 0 | 0 | | | | | | | | End Run 10 (FL070) |
| 13:45:10 | 8903 | 0.07 | 2919 | 5000 | | 35 | 200 | 200 | 200 | | | | | | | 3 | Start Run 11 (FL070) |
| 13:48:00 | 298 | 0.14 | 3001 | 8 | | 0 | 0 | 0 | 0 | | | | | | | | |
| 13:50:00 | 338 | 0.16 | 3001 | 8 | | 0 | 0 | 0 | 0 | | | | | | | | |
| 13:52:00 | 331 | 0.16 | 3001 | 5 | | 0 | 0 | 0 | 0 | | | | | | | | |
| 13:54:00 | 338 | 0.16 | 3001 | 8 | | 0 | 0 | 0 | 0 | | | | | | | | |
| 13:55:14 | 328 | 0.17 | 3001 | 8 | | 0 | 0 | 0 | 0 | | | | | | | | End Run 11 (FL070) |
| 13:56:20 | 22260 | 0.15 | 3036 | 4000 | | 3 | 125 | 18 | 125 | | | | | | | 10 | Small droplets? |
| 13:58:00 | 532 | 0.17 | 3114 | 80 | | 5 | 0 | 0 | 200 | | | | | | | 10 | |
| 14:00:00 | 482 | 0.17 | 3120 | 20 | | 0 | 0 | 0 | 0 | | | | | | | | |
| 14:02:00 | 12873 | 0.17 | 3159 | 2000 | | 0 | 0 | | 200 | | | | | | | | |
| 14:04:00 | 447 | 0.17 | 3159 | 20 | | 0 | 0 | 0 | 500 | | | | | | | | FL050 |
| 14:06:00 | 3218 | 0.15 | 3217 | 1000 | | 1.5 | | 0 | 0 | | | | | | | | |
| 14:08:00 | 14715 | 0.16 | 3316 | 2000 | | 0.5 | 25 | 41 | 500 | | | | | | | 10 | |
| 14:10:00 | 11868 | 0.16 | 3428 | 1000 | | | | | | | | | | | | 10 | |
| 14:12:00 | 802 | 0.17 | 3487 | 40 | | 0 | 0 | 0 | 0 | | | | | | | | |
| 14:14:00 | | | | | | | | | | | | | | | | | |

# CLOUD PHYSICS LOG Flight B

| Date:18/05/06 | Operator: KT | DRS Time: 08:30:00 | DAU1 Time: +0 | DAU2 Time: +0 | DAU3 Time: +0 | Aux1 Time: +0 | Aux2 Time: +0 | Page 5 of 5 |
|---|---|---|---|---|---|---|---|---|



| G.M.T | PCASP | | FFSSP | SID1 | SID2 | 2D2-C | | 2D2-P | | CIP25 | | | CIP100 | | | Habit | Remarks |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Conc/cc | Mean R | Block TX | Count | Count | Conc/L | Max size | Conc/m3 | Max size | Conc m3 | Max size | LWC | Conc m3 | Max size | LWC | | |
| | | | | | | | | | | | | | | | | | |
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# CLOUD PHYSICS LOG Flight B

| Date:18/05/06 | Operator: KT | DRS Time: 08:30:00 | DAU1 Time: +0 | DAU2 Time: +0 | DAU3 Time: +0 | Aux1 Time: +0 | Aux2 Time: +0 | Page 6 of 6 |
|---|---|---|---|---|---|---|---|---|



| G.M.T | PCASP | | FFSSP | SID1 | SID2 | 2D2-C | | 2D2-P | | CIP25 | | | CIP100 | | | Habit | Remarks |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Conc/cc | Mean R | Block TX | Count | Count | Conc/L | Max size | Conc/m3 | Max size | Conc m3 | Max size | LWC | Conc m3 | Max size | LWC | | |
| | | | | | | | | | | | | | | | | | |
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| | | | | | | | | | | | | | | |

# CLOUD PHYSICS PROCESSING LOG

**Flight number:** B200 **Date:** 18/05/2006

| B) FFSSP PROCESSING | | |
|---|---|---|
| Processing Stage | Completed | Comments |
| 1) Transfer *.txt files from DVD to PC<br>B200_FFSSP_hh.txt for each hour of data<br>B200_FFSSP_HVMS.txt | | |
| 2) FTP the files (ascii) from the PC to the directory PMSDATA: on FLOODS | 19/06/06 | |
| 3) RUN MRFB:[PMS.FAST_FSSP]FSSP_EXTRACT_TAS<br>a) Flight number: B200<br>b) Path name: MFDDATA:B200_MFDX<br>c) Output directory: PMSDATA:<br>d) Start time: 0 if unknown<br>e) End time: 240000 if unknown | <br><br><br><br>0<br>142121 | <br><br><br><br>Problems running this but Manually edited o/p file |
| 4) RUN MRFB:[PMS.FAST_FSSP]FFSSP_PROCESS_TXT<br>a) Flight number: B200<br>b) Directory: PMSDATA:<br>c) TAS in processing: Y<br>d) Vel threshold (clicks) 0<br>e) Calibration file: Use, in order of preference,<br>- if a calibration exists after the flight date, then the file that is closest in time to it,<br>- or the most recent calibration file prior to the flight date.<br>Format FFSSP_CALddmmyyyy.txt<br>Calibration files to be stored in MRFB:[PMS.FAST_FSSP]<br>f) Adjust FFSSP time Y/N<br>g) If Y, enter value to add to data time (seconds) | <br><br><br><br><br><br><br><br><br><br><br>N<br>21/06/06 | Note the calibration file used<br><br><br><br><br><br><br>FFSSP_CAL03052006.TXT<br><br><br>Yes only if gross errors occur in FFSSP time eg; ~ 1hour |
| 5) In PVWAVE<br>a) enter:<br>!path=!path+',mrfb:[pms.proc]'<br>Note that the comma before "mrfb" is important!<br>b) write_procffssp_to_m5,'pmsdata:B200_procffssp.dat', 'mfddata:B200_mfdX','pmsdata:B200_m5procffssp',/auto<br>1st argument is output file from 5)<br>2nd argument is the MFD<br>3rd argument is the new FFSSP data file in M5 format | | <br><br><br><br><br>Note the correction applied to FFSSP time by /auto 2 secs manually added |
| c) exit | 21/06/06 | |
| 6) MODIFY<br>a) Modifying datasets: pmsdata:B200_m5procffssp<br>b) Datset: mfddata:B200_mfdX<br>c) New dataset: Enter updated MFD name<br>d) Parameter description file: leave blank to use default | <br><br><br><br>21/06/06 | |
| 7) CHECKS: | | |
| i) FFSSP and JW/Nevzorov LWC – are they correctly synchronized in time? | | YES. OK agreement with Nevzorov LWC |
| ii) If not, may be necessary to repeat 5b) using addt=x keyword. This adds x sec to FFSSP time. | | Nevzorov has lots of flag 2 data where TWC is zero/3 in cloud |
| iii) Alternative at 5b) is to use ,auto=602 or auto=605 to align FFSSP with Nevzorov LWC or TWC. | | |

# CLOUD PHYSICS PROCESSING LOG

**Flight number:** B200 **Date:** 18/05/2006

| C) 2D PROCESSING | | |
|---|---|---|
| Processing Stage | Completed | Comments |
| 1) Transfer B200.dat file from CD/DVD to PC | | |
| 2) Zip up file on PC (B200.zip) | | |
| 3) FTP the zipped file (binary) from the PC to the directory SEADAS_DATA:[SEADAS_DATA] on FLOODS | | |
| 4) Log on to FLOODS | | |
| 5) unzip SEADAS_DATA:[SEADAS_DATA]B200.zip | | |
| 6) In PVWAVE<br>i) !PATH=!PATH+',MRFB:[PMS.PROC]'<br>ii) CONVERT_SEADAS_FILE<br>a) Input file: SEADAS_DATA:[SEADAS_DATA]B200.dat<br>b) Output file: SEADAS_DATA:[SEADAS_DATA] B200_seadas.dat<br>iii) exit | 19/06/06 | Note the number of bad block reads and/or final numbers of blocks read & written<br>65380 blocks read/written<br>No bad reads |
| 7) run MRFB:[PMS.SEADAS]READM200_FILE<br>a) Default directory: PMSDATA:<br>b) Flight number: B200<br>c) Disk file name: SEADAS_DATA:[SEADAS_DATA] B200_seadas.dat<br>d) Comment string:<br>e) Start time: 0 if unknown<br>f) End time: 240000 if unknown<br>g) Read 2DC: Y<br>h) Read 2DP: Y<br>i) Secondary data N<br>j) FSP-SYNC: Y<br>k) cmd.str: N<br>l) Auto time correction: N<br>m) Full length secondary: N | 19/06/06 | Don't worry about lots of FORTRAN run-time errors as long as the program continues. These are format errors when writing to ascii files.<br>Not required<br>Not required |
| 8) 2D image display and printing<br>Quick look at image blocks if required<br>In PVWAVE<br>i) !PATH=!PATH+',MRFB:[PMS.PROC]'<br>i) WAVE> IMAGEDISPLAY<br>a) 2D directory name: PMSDATA:<br>b) Flight number: B200<br>c) IWC plot: N<br>d) Select probe: (1) 2DC (2) 2DP<br>e) Start time: 0 if unknown<br>f) End time: 240000 if unknown<br>g) Time interval (sec): 0 for every image block nominal 5 sec | | This section is optional<br>Features to look for:<br>1) Noise on 2D-P – does it affect non-edge diodes (with potential to create spurious particle counts)?<br>2) Can you identify a dominant particle habit for the whole flight (eg. drops or crystals)<br>3) |
| Preparation of imagery for Core data product<br>iii) WAVE> auto_image<br>a) 2D directory name: PMSDATA:<br>b) Flight number: B200 | | |

| | | |
|---|---|---|
| c) Enter date: YYYYMMDD<br>d) Enter start time 0 if unknown<br>e) Enter end time 240000 if unknown<br>f) Enter time interval (sec) between successive imaged blocks<br>10<br>iv) exit PVWAVE Creates files | 0<br>240000<br>10<br>PMSDATA: | FAAM_YYYYMMDD_R0_B200_2Dx-IMAGES.PS |
| ftp *.PS files from PMSDATA: to PC | | |
| Load each into Ghostview or other pdf-converter | | |
| Output as pdf file (70 dpi resolution) and append name prefix of CORE-CLOUD-PHY_ to converted files | | |
| 9) run MRFB:[PMS.SPEC2D.AUTO]PROCESS2D_AUTO<br>a) Flight number: B200<br>b) Directory: PMSDATA:<br>c) File generation: Hit enter<br>d) Time correction: Time offset of the 2D data | | If program crashes at a certain Time, for any reason, re-run With that time as the new end. |
| e) TAS: Y<br>f) MFD directory: MFDDATA:B200_MFDX<br>g) Probe number: (1) 2DC (2) 2DP (0) Both<br>0 unless either probe known to be faulty<br>h) Start time: Take-off or 0 if unknown<br>i) End time: Landing or 240000 if unknown<br>j) Nominal averaging: 0.2 seconds for conversion to M5<br>k) Particle type: 8 if known to be in ice cloud<br>11 if known to be in water cloud<br>8 if known to be in mixed-phase<br>8 if unknown<br>l) Coefficient choice: 2<br>m) Output root filename: PMSDATA:B200_PROC2D | 0<br>094630<br>142120<br>0.2<br>8 / 8<br>2 | Look for realistic times in Flight Summary file or Cloud Phys operator log.<br>Note the particle type<br>Not run yet – crashes due to TAS problems |
| 10) In PVWAVE<br>i) enter:<br>!PATH=!PATH+',MRFB:[PMS.PROC]'<br>Note that the comma before "mrfb" is important!<br>ii) WRITE_PROC2D_TO_M5, 'PMSDATA:B200_PROC2D.DAT', 'PMSDATA:B200_M5PROC2D'<br>iii) exit | 21/06/06 | Note: This will run quicker if you specify correct start / end times at 9h) and 9j). |
| 11) MODIFY<br>a) Modifying datasets: pmsdata:B200_m5proc2D<br>b) Datset: mfddata:B200_mfdX<br>c) New dataset: Enter modified MFD name<br>d) Parameter description file: leave blank to use default | 21/06/06 | |
| 12) CHECKS: | | |
| i) Is 2DC/2DP IWC of comparable magnitude and well-correlated with Nevzorov TWC? | | Seems OK |
| | | |
| | | |
| | | |
| | | |

# CLOUD PHYSICS PROCESSING LOG

**Flight number:** B200 **Date:** 18/05/2006

| **D) PCASP PROCESSING** | | |
|---|---|---|
| Processing Stage | Completed | Comments |
| 1) Complete stage 7) in 2D processing<br>Ensures B200_FSP.DAT containing raw PCASP data is written to directory PMSDATA: | | |
| 2) run MRFB:[PMS.PCASP]PROCPCASP_NEW<br>a) Flight number: B200<br>b) File name: PMSDATA:B200_FSP.DAT<br>c) Root output name: PMSDATA:B200_PROCPCASP<br>Produces PMSDATA:B200_PROCPCASP.DAT (binary)<br>PMSDATA:B200_PROCPCASP.OUT (ascii)<br>d) Minimum size channel: Default = 1<br>If smallest size channel are known to be noisy the value of the highest noise free channel to be entered here<br>e) Calibration volume flow rate:<br>Use the most recent value.<br>Calibration files to be stored in **????**<br>Entering zero gives default value = 1.0 cm3/sec<br>f) Time correction: Same value as used in 2D processing stage 9 d)<br>g) Start time: Take-off or 0 if unknown<br>h) End time: Landing or 240000 if unknown | <br><br><br><br><br>1<br><br><br>1.0<br><br><br><br>094630<br><br>142120 | Note the min size channel<br>Note the volume flow rate<br><br><br><br><br><br><br><br><br>Look for realistic times in Flight Summary file or Cloud Phys operator log. |
| 3) In PVWAVE<br>i) enter:<br>!PATH=!PATH+',MRFB:[PMS.PROC]'<br>Note that the comma before "mrfb" is important!<br>ii) write_procpcasp_to_m5,'pmsdata:B200_procpcasp.dat' ,'pmsdata:B200_m5procpcasp'<br>iii) exit | <br><br><br><br><br><br>21/06/06 | Note: This will run quicker if you specify correct start / end times at 2g) and 2h). |
| 4) MODIFY<br>a) Modifying datasets: pmsdata:B200_m5procpcasp<br>b) Datset: mfddata:B200_mfdX<br>c) New dataset: Enter modified MFD name<br>d) Parameter description file: leave blank to use default | <br><br><br>MFDB | |

# CLOUD PHYSICS PROCESSING LOG

**Flight number:** B200 **Date:** 18/05/2006

| **E) NetCDF file preparation and ftp to BADC** | | |
|---|---|---|
| Processing Stage | Completed | Comments |
| 1) Run TAREXEC:MFD_BADC | | |
| For inputs below, just press ENTER to use defaults | | Defaults in [square brackets] |
| a) MFD to convert: MFDDATA:B200_MFDX<br>b) version number for BADC: r[0]<br>c) Names file:<br>TARDIS_ROOT:[CALTEXT.NETCDF]CP_NAMES.TXT<br>d) Directory: [ DATA_ROOT:[NETCDF] ]<br>e) File prefix: [ core-cloud-phy_faam ]<br>f) File suffix: [ ]<br>g) File for output:<br>[ core-cloud-phy_faam_yyyymmdd_rm_B200.nc ] | 21/06/06 | As from 4c) above<br>default<br>NOT the default<br>default<br>default<br>default<br>Default name is generated |
| 2) Ftp transfer to BADC<br>- stage 1) creates two files:<br>- core-cloud-phy_faam_yyyymmdd_rm_B200.nc<br>- core-cloud-phy_faam_yyyymmdd_rm_B200.txt<br>The *.txt file should be renamed to core-cloud-phy_faam_yyyymmdd_rm_B200_descrip.txt<br><br>but this cannot be done on VMS as the filename is too long You should do it if the file is first transferred to a PC, or after it has been uploaded to the appropriate “incoming” directory at BADC<br><br>a) ftp ftp.badc.rl.ac.uk<br>b) login with username and password<br>c) cd /incoming/faam/campaign-processed-core<br>d) copy *.txt file as ascii<br>e) copy *.nc and *2D-IMAGES.pdf files as binary | 21/06/06 | |

| **F) BACKUP PROCEDURES** | | |
|---|---|---|
| Processing Stage | Completed | Comments |
| 1) Backup the intermediate files created in PMSDATA:<br><br>a) zip “-V” PMSDATA:B200*.* outdir:B200_PMSDATA.zip<br><br>Note that the uppercase “-V” option is important to preserve the VMS file characteristics when files are restored from this zip file. | | Note destination directory “outdir”<br><br>In CLOUD_PHYS:[BROWN.PMSZIP] |

# CLOUD PHYSICS PROCESSING LOG

**Flight number:** B200 **Date:** 18/05/2006

| **A) Raw data transfer to BADC** | | |
|---|---|---|
| Processing Stage | Completed | Comments |
| 1) Transfer raw data files from DVD to PC<br>B200_FFSSP_hh.txt for each hour of data<br>B200_FFSSP_HVMS.txt<br>B200_FFSSP.raw<br>B200_FFSSP_House_1.hse etc.<br><br>2) Zip these file on the PC<br>-output file:<br>core-cloud-phy_faam_yyyymmdd_r0_b200_rawffssp.zip | | Raw data sent to BADC from FAAM |
| 3) Transfer SEADAS B200.dat file from CD/DVD to PC<br>4) Zip up file on PC (B200.zip)<br>- rename B200.zip to core-cloud-phy_faam_yyyymmdd_r0_b200_rawseadas.zip | | |
| 5) ftp to BADC<br>a) ftp ftp.badc.rl.ac.uk<br>b) login with username and password<br>c) cd incoming/faam/campaign_raw<br>d) bin<br>e) put core-cloud-phy_faam_yyyymmdd_r0_b200_rawffssp.zip<br>f) put core-cloud-phy_faam_yyyymmdd_r0_b200_rawseadas.zip | | Binary data transfer |

| FLIGHT NUMBER: B10a | DATE: 18/5/06 | OPERATOR: R. COTTON | Page 1 of 2 |
|---|---|---|---|
| PROJECT: ICE PIC | | | |

# CCN LOG

| ALLEVIATOR GMT | | HEIGHT | TEMP INLET | | | STATIC | | | | REMARKS |
|---|---|---|---|---|---|---|---|---|---|---|
| ON | OFF | | 24.07 | 1 | 2 | 3 | 4 | 5 | | |
| | | | 20.36 | 1.75 | 2.5 | 3.5 | 4.25 | 5.5 | | |
| START | OF | RUN 0 | | 0.17 | 0.30 | 0.50 | 0.70 | 1.07 | S | |
| | | | | 241 | 290 | 258 | 335 | 1137 | D | |
| | | | | 270 | 261 | 236 | 236 | 221 | B | SLOW TO STABILIZE |
| | | | | 2379 | 2338 | 2337 | 2335 | 2331 | R | 15 MIN TOTAL |
| | | | | 995.5 | 995.7 | 995.7 | 995.6 | 995.5 | P | |
| | | | | | | | | | | |
| | | | | 1.75 | 2.5 | 3.5 | 4.25 | 5.5 | | |
| | | | | | | | | | S | |
| | | | | | | | | | D | |
| | | | | | | | | | B | |
| | | | | | | | | | R | |
| | | | | | | | | | P | |
| | | | | 1.75 | 2.5 | 3.5 | 4.25 | 5.5 | | |
| | | | | | | | | | S | |
| | | | | | | | | | D | |
| | | | | | | | | | B | |
| | | | | | | | | | R | |
| | | | | | | | | | P | |
| | | | | | | | | | | |
| | | | | 1.75 | 2.5 | 3.5 | 4.25 | 5.5 | | |
| | | | | | | | | | S | |
| | | | | | | | | | D | |
| | | | | | | | | | B | |
| | | | | | | | | | R | |
| | | | | | | | | | P | |
| | | | | 1.75 | 2.5 | 3.5 | 4.25 | 5.5 | | |
| | | | | | | | | | S | |
| | | | | | | | | | D | |
| | | | | | | | | | B | |
| | | | | | | | | | R | |
| | | | | | | | | | P | |
| | | | | | | | | | | |
| | | | | 1.75 | 2.5 | 3.5 | 4.25 | 5.5 | | |
| | | | | | | | | | S | |
| | | | | | | | | | D | |
| | | | | | | | | | B | |
| | | | | | | | | | R | |
| | | | | | | | | | P | |
| | | | | 1.75 | 2.5 | 3.5 | 4.25 | 5.5 | | |
| | | | | | | | | | S | |
| | | | | | | | | | D | |
| | | | | | | | | | B | |
| | | | | | | | | | R | |
| | | | | | | | | | P | |
| | | | | | | | | | | |
| | | | | 1.75 | 2.5 | 3.5 | 4.25 | 5.5 | | |
| | | | | | | | | | S | |
| | | | | | | | | | D | |
| | | | | | | | | | B | |
| | | | | | | | | | R | |
| | | | | | | | | | P | |

| Microwave Radiometers FLIGHT LOG | Date | 18/05/06 | Flight | B200 | log pages | |
|---|---|---|---|---|---|---|
| Operator(s) | James Bowles | | Campaign | ICEPIC | | |
| Departure | Cranfield | | Arrival | Cranfield | | |

## System start

### MARSS

| | | | | | | |
|---|---|---|---|---|---|---|
| Visual pod inspection | | | | | | • |
| Close 3 SSP circuit breakers | | | | | | • |
| Close all MARSS circuit breakers | | | | | | • |
| FERA on | | | | at time | 08:07 | |
| Temperature controller initial temps | Ch16 | 18.3°C | Ch 17 | 18.1°C | Ch18 -20 | 17.6°C |
| Temperature controller set points | | 54°C | | 58°C | | 40°C |
| MARSS CPU on | | | | at time | 08:08 | |
| Initial target temperatures | Hot | 290.3 | | Cold | 292.3 | |
| Target heating | | | | | | • |
| *** CHECK SCAN HEAD CLEAR *** | | | | | | • |
| Scanning on (LMD box) | | | | at time | 08:15 | |
| Scan indication | | Monitor | • | | Visual | • |

### Deimos

| | | | | |
|---|---|---|---|---|
| Close all Deimos circuit breakers | NOT FITTED | | | |
| Turn on Deimos CPU | | | | |
| *** CHECK SCAN HEAD CLEAR *** | | | | |
| Start Deimos Software | | | at time | |
| Initial target temperatures | Hot | | Cold | |
| Target heating | | | | |
| Scan indication | | Monitor | | Visual |
| Weather | Cloud | 2/8 cu | Precip | none |
| | Surface | dry | Pressure | |
| | Other | | | |

## System functionality check

(after initial system warmup, approx 1 hour)

| | | | | | | |
|---|---|---|---|---|---|---|
| PC to DRS Time error | | $t_{PC}=t_{DRS}$ + | 0 | at time | 08:59 | |
| Brightness temps 'sensible' | | | | | | • |
| Target temps | MARSS: | Hot | 344.54 | Cold | 295.34 | |
| | Deimos: | Hot | | Cold | | |

| Channel gains 'sensible' | Ch1 A ( - ) | Ch3 A ( - ) | Ch1 B ( - ) | Ch3 B ( - ) | |
|---|---|---|---|---|---|
| | | | | | |
| | Ch16 (40-44) | Ch17 (45-49) | Ch18 (40-44) | Ch19 (40-44) | Ch20 (44-48) |
| | 43.96 | 35.15 | 38.11 | 41.21 | 42.49 |

## Power changeover

| | | |
|---|---|---|
| Headset on before start | | • |
| Listen to engine start sequence | 4, 3, 2, 1. | • |
| LMD off (3 switches, bottom to top) | | • |
| Exit Deimos Software (x) | | |
| POWER CHANGEOVER | | |
| LMD on (3 switches, top to bottom) | then pushbutton | • |
| Restart Deimos Software | | |
| System running again | | at time |
| | | 09:22 |
| | | |

| Flight # | B | Date | | Operator(s) | | log page | 2 | of | 2 |
|---|---|---|---|---|---|---|---|---|---|

| *Time* | Run id | Alt/FL | *Remarks* | Sys |
|---|---|---|---|---|
| **08:21** | **prefli** | | Ch.16 u/s to start | |
| **08:33** | **“** | | Ch.16 power cycled + now working | |
| **09:33** | | | Takeoff | |
| **09:40ish** | **Trans** | | In cloud | |
| **09:48** | **“** | | Out of cloud | |
| **10:06** | **“** | | Land-sea | |
| | **P1** | | Descent to msa | |
| **10:26** | | | P1 int & turn about | |
| **10:29:51** | **P1** | | Interrupt & turn | |
| **10:35** | | | Under layer sc | |
| **10:38** | | | P1 end | |
| **10:39** | | | Under small cu patchy + manouvers | |
| **10:43:55** | | | R1.0 500ft below scattered cloud | |
| **10:53:23** | | | Eor1 | |
| **10:55:07** | | | R1.1 same height | |
| **10:58** | | | Precip | |
| **11:05** | | | Eor + cimbing | |
| **11:05** | | | Into cloud | |
| **11:12:28** | **R2** | | 7000ft in cloud/ in and out smallish cu | |
| **11:15** | | | Precip | |
| **11:19** | | | Eor2 | |
| **11:22:29** | **R2** | | 8000ft ? -4C in & out cloud | |
| **11:34:** | | | Eor | |
| **11:37:25** | **R3** | | 9000ft -6C in/out cloud | |
| | **R4?** | | | |
| **11:48:03** | **R5** | | 10000ft in/out cloud | |
| **12:05:48** | | | Eor5 | |
| **12:06:54** | **P2** | | Descent to 500ft below cloud gen clear sky | |
| **12:16:15** | **Eop** | | | |
| **12:17** | **R6** | | Below cloud some manouvering | |
| **12:30:09** | **Eor6** | | Climbing to 0C | |
| **12:35?** | **R7** | | In cloud | |
| **12:44:57** | **Eor7** | | Climbing to –9C | |
| **12:48** | | | In clearish skies some cirrus above | |
| **12:49:40** | **R8** | | Starts clear | |
| **12:51** | | | In cloud -still ci above when between cells | |
| **13:04** | | | Cu below, ci above not in cloud | |
| **13:08:05** | **Eor8** | | Turning | |
| **13:10** | **R9** | | FL110 towards chilbolton cu below,patchy ci above. | |
| **13:17** | | | Unbroken Cu below , clear above | |
| **13:19:32** | **Eor9** | | Broken cu (7/8) again below clear above | |
| **13:23:58** | **P3** | | Descent to 7000ft | |

13:25 in cloud
13:27:10 R10 incloud
13:28 patchty ci above and patchy cu below between main cells
13:32 mostly clear air with above situ. Only occasional cells
13:39 thicker ci above
13::40 skipping cu tops below
13:42:37 oer10 & turning
13:45:10 r11 entering cloud
13:47 out of cloud, broken cu below, ci above

| *Time* | Run id | Alt/FL | *Remarks* | Sys |
|---|---|---|---|---|
| 13:55:40 | eor11 | ci thinning at this point | & Descent into cloud | |
| 13:57 | | ci very patchy in/out cu | | |
| 14:15 | | below cu | | |
| 14:26 | MARSS PC 11 sec fast | | | |

# B200 ICEPIC . SW APPS . CAMERA LOG . (FROM MISSION SC. / FLIGHT DECK)

| | | | | |
|---|---|---|---|---|
| ① | 1012 ½ | LOOKING AHEAD & TO PORT. | 20,000 FT. (FL 200) | VIEW OF CU LINE BUILDING SW → NE TO SOUTH OF A/C. |
| ② | 1318 | LOOKING AHEAD (HEADING ENE) | FL 110 | VIEW OF LARGER CU AHEAD. |
| ③ | 1328 | STBD | FL 070 | CU FIELD AROUND A/C. |
| ④ | | FORWARD | | |
| ⑤ | | PORT (HEADING WSW) | | |
| ⑥ | 1335 | FORWARD (HEADING WSW). | FL 070 | CLOUD AHEAD. |
| ⑦ | | | | |
| ⑧ | 1336 | FORWARD (HEADING WSW) | FL 070 | CU CLOUD AHEAD. |
| ⑨ | 1352. | FORWARD (HEADING E). | FL 070. | VIEWS OF CU TOPS (up to FL 090). |
| ⑩ | | | | |

DRK 18/5/06

Flight Manager's Instrument Status Log

Flight No. **B** 200 Date: 18th May 2006

| Instrument | Operated | Instrument | Operated |
|---|---|---|---|
| **Navigation** | | **Cloud Physics** | |
| INU | **Y** | **Probes** | |
| XR5M GPS | **Y** | FFSSP | **Y** |
| Cruciform GPS | **Y** | PCASP | **Y** |
| Satcom C | **Y** | 2D-P | **y** |
| Satcom H | **Y** | 2D-C | y |
| **Thermometers** | | Cloudscope | **N** |
| De-Iced Temp | **Y** | SID 1 | **y** |
| Non De-Iced | **Y** | SID 2 | **n** |
| Heimann | **Y** | HVPS | **N** |
| **Hygrometers** | | CIP25 | **N** |
| G. Eastern | **Y** | CIP100 | **N** |
| J. Williams | **Y** | | |
| Nevzorov | **Y** | | |
| TWC | **Y** | **Racks:** | |
| FWVS | **y** | INC | **N** |
| **Radiometers** | | CCN / CPC | **y** |
| Upper Clear | **Y** | CVI | **N** |
| " Red | **Y** | | |
| " Silicon | **Y** | | |
| " SHIMS | **Y** | **Aerosol** | |
| Lower Clear | Y | PSAP | **n** |
| " Red | **Y** | Nephelometer | **n** |
| " Silicon | **Y** | Filters | **N** |
| | | AMS | **y** |
| **Large Radiometers** | | | |
| IR Camera | | | |
| TAFTS | **N** | | |
| MARSS | **Y** | **Others:** | |
| DEIMOS | **n** | IR Camera | **n** |
| ARIES | **n** | NIR TDLAS | N |
| SWS | n | 2BT O3 | N |
| **Chemistry** | | VACC | N |
| Ozone | Y | PEROXIDE | N |
| SO2 | y | Formaldehyde | N |
| NOX | Y | ADA | N |
| CO | Y | CPI | y |
| ORAC | N | Noxy | N |
| PAN | N | PTRMS | N |
| PERCA | N | Bag Sampling | N |
| WAS | N | Tube Sampling | N |

# Faults / Incidents Log

**Flight No.** B200
**Date:** 18th May 2006

## Instruments

1. DITM went to full scale several times during flight, this affects many derived parameters
2. FFC iced over several times despite demister on
3. Outboard video signal occasionally intermittant
4. TWC – status light came on at temperatures less than –25C
5. Heimann total water alarm sets occasionally, usually in cloud

## Aircraft

## Satcom Calls

1 x Met Office (Chilbolton)

**MISSING LOG SHEETS:**

The following log sheets are not available for flight B200:

| Log | Reason |
|---|---|
| Core Chemistry | NO log taken - replaced by post flight auto cal removal |
| CPI | Log only of interest to instrument operator so no copy left with FAAM |
| | |

**Document control**

| Revision | Date | Author | Comments |
|---|---|---|---|
| r0 | 26 Sep 2006 | Doug Anderson | Initial version missing the above noted logs |
| r1 | | | |
| r2 | | | |

**VIDEO RECORDINGS:**

3 x Forward Facing Cameras
3 x Rearward Facing Cameras

Digital8 video recordings from this flight reside with :

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